Application No.: 10/676,115

Examiner: Hung S. Bui

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## **AMENDMENTS TO THE SPECIFICATION:**

Please amend paragraphs [0008]-[0010] to read:

[0008] In accordance with an aspect of the present invention, the electronic apparatus with natural convection structure includes a main body to be placed on a surface, a hole an airflow channel piercing through the main body from a top surface to a bottom surface thereof, and a supporting device disposed on the bottom surface of the main body.

[0009] The electronic apparatus further includes at least a printed circuit board disposed in the main body and having an opening, wherein the centroids of the opening and the hole <u>airflow channel</u> are positioned at the same axis vertical to the top surface and the bottom surface.

[0010] Preferably, the electronic apparatus has plural holes airflow channels, and the printed circuit board has plural openings as well.

Please amend paragraphs [0013] - [0015] to read:

[0013] Preferably, the distances from the hole <u>airflow channel</u> to the edges of the main body are substantially equal.

[0014] Preferably, the hole <u>airflow channel</u> has an opening at one side of the main body.

[0015] Preferably, the main body and the hole airflow channel are integrally formed.

Please amend paragraphs [0017] - [0019] to read:

[0017] In accordance with another aspect of the present invention, the electronic apparatus with natural convection structure includes a main body to be placed on a surface, in which the main body having a top surface and a bottom surface, and the bottom

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surface having a curve structure, and a hole an airflow channel piercing through the main body from the top surface to the bottom surface.

[0018] The electronic apparatus further includes at least a printed circuit board disposed in the main body and having an opening, wherein the centroids of the opening and the hole <u>airflow channel</u> are positioned at the same axis vertical to the top surface and the bottom surface.

[0019] Preferably, the electronic apparatus has plural holes airflow channels, and the printed circuit board has plural openings as well.

Please amend paragraphs [0022] - [0024] to read:

[0022] Preferably, the distances from the hole <u>airflow channel</u> to the edges of the main body are substantially equal.

[0023] Preferably, the hole <u>airflow channel</u> has an opening at one side of the main body.

[0024] Preferably, the main body and the hole <u>airflow channel</u> are integrally formed.

Please amend paragraph [0026] to read:

[0026] In accordance with an additional aspect of the present invention, the electronic apparatus with natural convection structure includes a main body to be placed on a surface, in which the main body having a top surface and a bottom surface, and the bottom surface having a curve structure, a hole an airflow channel piercing through the main body from the top surface to the bottom surface, and a supporting device disposed on the bottom surface of the main body.

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## Please amend paragraphs [0037] - [0041] to read:

[0037] Please refer to Fig. 3 which is a schematic view showing the electronic apparatus with natural convection structure according to a first preferred embodiment of the present invention. As shown in Fig. 3, the electronic apparatus at least includes a main body 31, a hole an airflow channel 32 and a supporting device 33. The main body 31 can be placed on a surface and has a printed circuit board 34 disposed therein. The printed circuit board 34 has an opening 341, in which the centroids of the opening 341 and the hole airflow channel 32 are positioned at the same axis that is vertical to a top surface 311 and a bottom surface 312 of the main body 31, so that the hole airflow channel 32 can pierce through the main body 31 from the top surface 311 to the bottom surface 312. In addition, the supporting device 33 is disposed on the bottom surface 312 of the main body 31, and has a specific height h which varies with the size of the electronic apparatus and is at least 3 mm so as to provide a natural air convection structure and increase the heat-dissipating area of the electronic apparatus.

Please refer to Fig. 4 which is a side view of Fig. 3. As shown in Fig. 4, the [0038] electronic apparatus is usually placed on a surface 41 such as a surface of a table or desk. When the electronic apparatus is being used, the temperature of the electronic elements on the interior printed circuit board gradually increases, and the heat generated from the electronic elements can be transferred to the surface of the electronic apparatus by conduction or radiation. In the meantime, the air near the bottom surface 312 of the electronic apparatus is heated and the temperature thereof increases due to the increasing temperature of the bottom surface 312. Since the supporting device 33 has a specific height h, there is a specific distance between the main body 31 and the surface 41. While the temperature of the air near the bottom of the main body 31 increases, the density thereof decreases; as a result, the air near the bottom of the main body 31 has a tendency to flow up, and can flow up though the hole airflow channel 32. Then the cool air surrounding the bottom of the main body 31 will fill the space left by the up-flowing warm air, thereby forming a cyclic airflow, which provides a better heat convection effect. By the cyclic airflow, the heat of the surface of the electronic apparatus is easily to be dissipated and the temperature thereof decreases. Therefore, the electronic apparatus of the present invention has a better heat-dissipating effect. Moreover, the hole airflow channel 32 is a piercing structure, which results in the increase of the surface area of the

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electronic apparatus as well as the total heat-dissipating area, so that the heat-dissipating effect of the electronic apparatus can be reinforced.

[0039] Certainly, the number, size and shape of the hole airflow channel of the electronic apparatus in the present invention are not limited. For example, the number of the hole airflow channel should be matched up with the wiring arrangement of the interior printed circuit board, and if possible, having more holes airflow channels is better for heatdissipation. In addition, the location of the hole airflow channel is not limited either. Usually, for improving the heat-dissipating effect, a preferred location of the hole airflow channel is at the center of the main body of the electronic apparatus, so that the distances from the hole airflow channel to the edges of the main body are substantially equal and thus the heat-dissipation of the electronic apparatus is more even. Alternatively, the location near the major heat-generating source of the printed circuit board is another preferred location of the hole airflow channel. The hole airflow channel can be located at one side of the main body, or further include an opening. Please refer to Fig. 5 which is a schematic view showing the electronic apparatus with natural convection structure according to a second preferred embodiment of the present invention. The hole airflow channel 52 is located at one side of the main body 51, and a sidewall of the hole airflow channel 52 further includes an opening 521. Therefore, when the electronic apparatus is used by a user, it can be hanged on a matching element via the hole airflow channel 52 and the opening 521 so as to fix the electronic apparatus.

Please refer to Fig. 6 which is a schematic view showing the electronic [0040] apparatus with natural convection structure according to a third preferred embodiment of the present invention. As shown in Fig. 6, the electronic apparatus at least includes a main body 61 and a hole an airflow channel 62. The bottom surface 612 of the main body 61 has a curve structure 613, which has a specific height H, and the hole airflow channel 62 pierces through the main body 61 from the top surface 611 to the bottom surface 612. When the temperature of the electronic apparatus increases, the curve structure 613 of the bottom surface 612 of the main body 61 can form a good airflow channel, and the warm air will flow along the curve structure 613 and pass through the hole airflow channel 62 so as to form a cyclic airflow. Therefore, the heat of the surface of the electronic apparatus is easily to be dissipated. Also, the hole airflow channel 62 can increase the surface area of

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the electronic apparatus as well as the total heat-dissipating area, and further improve the heat-dissipating effect of the electronic apparatus.

[0041] In conclusion, the electronic apparatus of the present invention has a hole airflow channel which pierces through the main body, and there is a specific height at the bottom of the electronic apparatus, so the warm air at the bottom of the electronic apparatus can flow up along the hole airflow channel and the surrounding cool air will fill the space. Therefore, a cyclic airflow is formed, which provides a better heat convection effect. In addition, the hole airflow channel can increase the surface area of the electronic apparatus as well as the total heat-dissipating area. As a result, the present invention overcomes the disadvantage of poor heat-dissipation of the prior art, and improve the heat-dissipating effect of the electronic apparatus. Moreover, with respect to manufacturing, the hole airflow channel and the main body of the electronic apparatus are integrally formed, so the manufacturing cost and time will not increase. Thus, the present invention possesses high industrial value.